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IS 10919 (1984): Glossary of Terms for Electrostatic Precipitators [MED 17: Chemical Engineering Plants and Related Equipment]



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“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

GLOSSARY OF TERMS FOR ELECTROSTATIC PRECIPITATORS

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1. Scope — Covers the definitions of terms commonly used in the industry for electrostatic precipitators.

2. Terminology — For the purpose of this standard, the various components of the precipitators shall be as designated in Fig. 1.

2.1 Casing — The casing depends on the configuration of the precipitator.

For rectangular precipitators, the roof, sides, ends, hoppers/bottoms, gas inlet and outlet constitute the casing. For cylindrical precipitator, the gas inlet, gas outlet, hopper/bottom, head and shall form the casing.

2.2 Insulator Compartment — It encloses the insulators to the high voltage system. It does not contain the roof as a whole but the insulators only.

2.3 Penthouse — It is a weatherproof gas-tight enclosure over the precipitator to contain the high voltage insulators.

2.4 Weather Enclosure — This is for the shelter of the maintenance/personnel on the roof of the precipitator.

2.5 Baffles — These baffles control the flow of the gas so that it does not pass through the precipitator without being influenced by the active field.

2.6 Gas Distribution Plates — These are simple perforated plates to evenly distribute the gas with uniform velocity.

2.7 Collecting Electrodes — These electrodes are a series of plates where particles get attracted and accumulate from where they are removed at regular intervals by vibrating the plates by rappers. The spacing of these plates depends upon voltage applied to the electrodes.

2.8 High Voltage Discharge Electrodes — These are either weighted steel wire type or see-saw strip type. Vibrators are provided to periodically remove accumulation of minor particles from surface of electrodes.

2.9 Damper — A device installed in the duct to regulate the gas flow by degree of closure.

2.10 Access for Maintenance

- a) If the accessibility is required frequently, a detachable cover or a cover with hinges is provided called door.
- b) If the accessibility is required at infrequent interval, a cover is provided with a number of bolts to ensure tight closure. This cover is called 'Bolted Plate'.

2.11 Vanes — The vanes guide the gas flow around a bend thereby minimizing the effect of the band.

2.12 Collecting Surface Area — The total flat projected area of the collecting surface exposed to the active electrostatic field.

2.13 High Voltage System — All parts of the precipitator which are maintained at a high potential.

2.14 Discharge Electrode Rapper — A device to impart vibration or shock to the discharge electrodes in order to dislodge the particles or dust accumulation.

2.15 Rapper Insulators — A device to isolate electrically, forces necessary to create vibration or shock in the high voltage system.

2.16 Single Chamber Precipitator — A precipitator without any internal dividing wall.

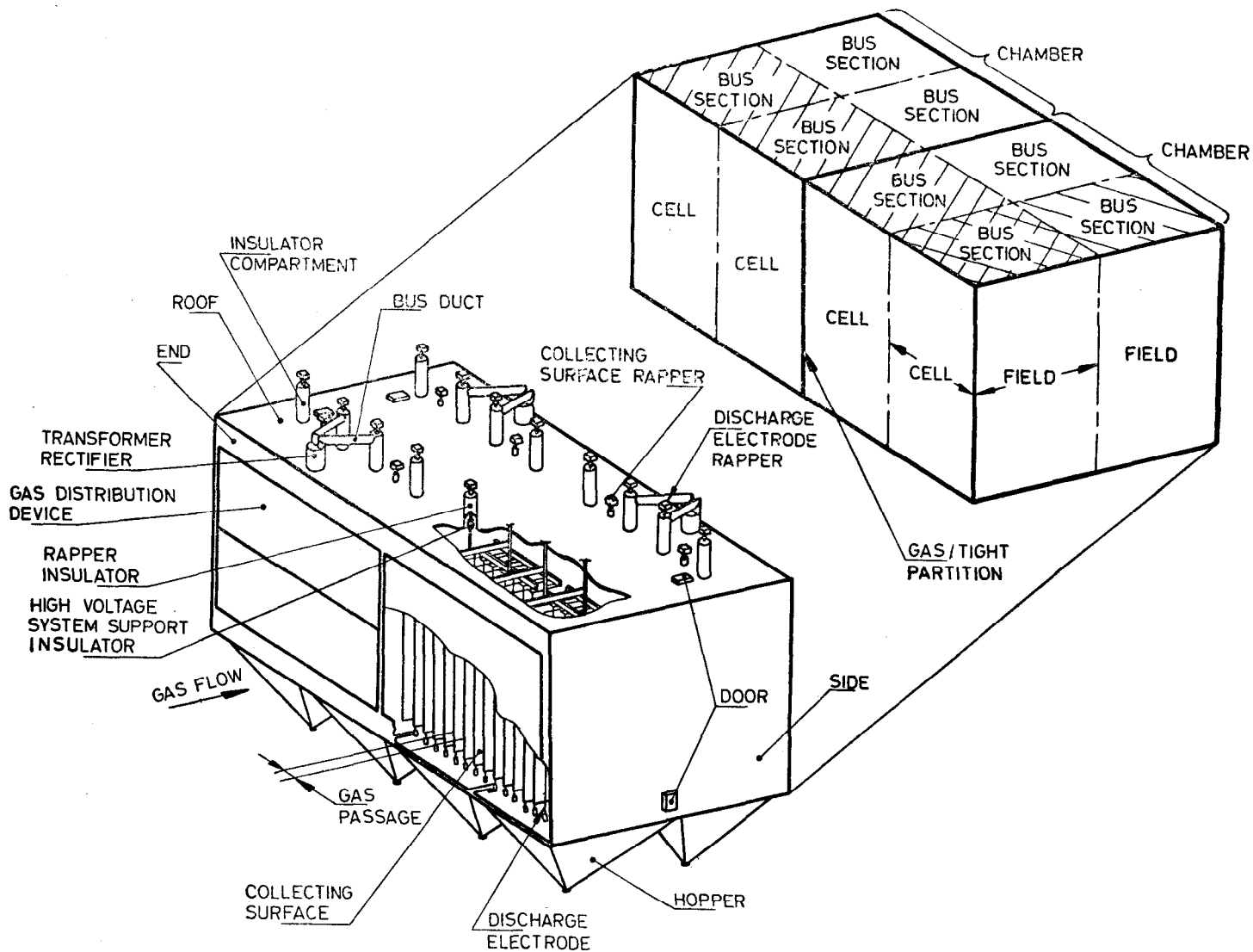


FIG. 1 ELECTROSTATIC PRECIPITATOR

2.17 Multi-chamber Precipitator — A precipitator having more than one internal dividing wall.

2.18 Power Supply — A transformer rectifier to supply high voltage d.c. with an automatic voltage control to maintain optimum voltage for the electrostatic precipitator to work at maximum efficiency under varying conditions.

2.19 High Voltage Conductors — Conductors to transmit the high voltage from transformer-rectifier to the precipitator high voltage system.

2.20 Collector Efficiency — The mass of the dust collected per unit mass of the dust entering the precipitator at a particular time interval.

2.21 Dust Concentration — The mass of the dust contained in a unit mass of the gas.

2.22 Gas Velocity — The volume rate of gas flow through the precipitator divided by the effective cross-sectional area of the precipitator.

2.23 Treatment Time — The time for which the gas remains in the precipitator. This is obtained by dividing the effective length of the precipitator in metres by the gas velocity.

- 2.24 Effective Length** — Total length of the collecting surface measured in the direction of gas flow.
- 2.25 Effective Width** — The centre-to-centre spacing of the collecting surfaces multiplied by the total number of gas passages.
- 2.26 Effective Height** — The total height of collecting surfaces measured from top to bottom.
- 2.27 Gas Passage** — The passage formed between two adjacent rows of collecting plates.
- 2.28 Hopper Capacity** — Total volumetric capacity of hoppers measured from a plane 25 cm below high voltage system to hopper outlet flange.
- 2.29 Bus Section** — The smallest portion of the precipitator which can be independently de-energized.
- 2.30 Field** — A field is an arrangement of bus-sections in the direction of gas flow, that is energized by one or more high voltage power supplier situated laterally across gas flow.
- 2.31 Aspect Ratio** — Active length divided by active height.
- 2.32 Precipitator** — Arrangement of electrodes and all other equipment for one independent casing.

EXPLANATORY NOTE

The glossary of terms for electrostatic precipitators given in this standard will enable better commercial understanding of various terms used in the field of electrostatic precipitators.

In the preparation of this standard assistance has been derived from 'Specifying air pollution Control equipment', edited by Richard A. Young and Frank L. Cross Jr., published by Marcel Dekker, Inc., New York in 1982.